경영학석사 학위논문

“Oh, You Poor Thing!” The Effect of Anthropomorphism on Empathy When Consumption Involves Damage to the Anthropomorphic Product Form

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ABSTRACT

“Oh, You Poor Thing!” The Effect of Anthropomorphism on Empathy When Consumption Involves Damage to the Anthropomorphic Product Form

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Literatures of anthropomorphism or attributing human mind and emotions to nonhuman objects contends that it render people to treat nonhuman beings in a similar way they treat other people. Also, the previous studies of anthropomorphism have mainly focused on its positive impact on people’s attitude and evaluation. However, this research explores that anthropomorphism can elicit negative emotions to the when consumptions require them to cause damage to the anthropomorphic product form (i.e., soap, cake, cleansing foam, and rug). The author finds that consumers of anthropomorphized products involving irreversible damage (i.e., soap and

cake) feel greater regret and lower satisfaction than those consuming products involving reversible damage (i.e., cleansing foam and rug). Finally, the negative impact on regret is found to be caused by empathetic concern elicited during consumption while the negative impact on satisfaction was not mediated by empathetic concern.

Keywords: product anthropomorphism, empathy, mind perception, post-consumption responses, regret

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INTRODUCTION

Even though we know that an object is not alive, there are times when we get upset because our beloved teddy bears get ripped apart or feel bad for trashing out the old car that we used to call by a name. Anthropomorphism or attributing human characteristics to nonhuman entities have gained interests from both the industries and the academia. From robots like Hanson Robotics' Sophia, to artificial intelligence speaker, Alexa, many high-tech companies have facilitated human interaction with nonhuman beings and put effort to developing more natural and pleasant interactive experiences. On the other hand, many researchers have explored the antecedents and consequences of anthropomorphism. Previous research mostly explored its positive consequences like enjoyment, liking, sense of connectedness, and evaluation (Lee, 2009; Kim & Sundar, 2012; Waytz, Heafner, & Epley, 2014; Tam, Lee, & Chao; 2013). Moreover, studies of anthropomorphism in marketing research have mainly investigated how it shapes and shifts attitudes through simple encounters. In those studies, the participants of these empirical studies were asked to view stimuli regarding brand anthropomorphism, product anthropomorphism, and personification in advertisement then evaluated the objects (Puzakova et al., 2013, Delbaere, McQuarrie, & Phillips, 2011; Aggarwal & McGill, 2007; Landwehr, McGill, & Herrmann, 2011).

However, the perception of human characteristics can entail negative or

unintended consequences, implying that anthropomorphism of objects should be imposed with care and from understanding its potential setbacks. (Lee, 2009; Puzakova, Kwak, & Rocereto, 2013; Bartneck, Bleeker, Bun, Fens, & Riet; 2010). Furthermore, consumers do not only derive value from purchasing goods, "value-of-exchange," but also define value during consumption of products, "value-in-use" (Varge & Lusch, 2004). Consumers' interaction with products do not occur at singly point in time rather, it is a process throughout the usage. The service dominant logic stresses that even when dealing with physical goods, one must keep in mind that consumers of the goods are obtaining the service which is embedded within the products. Following the perspective of the service dominant logic, many researchers have discovered how certain processes or incidents during usage affect customers.

Thus, in line with previous empirical findings where anthropomorphism causes negative outcomes, the author tries to discover another circumstance in which anthropomorphism create unfavorable experiences to consumers. In specific, the author investigates when anthropomorphism bring about negative post-consumption responses such as regret and satisfaction. Second, the author stresses the importance of "value-in-use" and explores how consumers respond to anthropomorphism of products that require them to cause some level of impairment to their anthropomorphic forms during consumption. Such approach aim to provide

more comprehensive understanding of consumers' interaction with anthropomorphized products. To test the effect of anthropomorphism across different levels of damage, products involving damage that is irreversible (i.e., cake and bar soap) and reversible (i.e., cleansing foam and rug) will be used.

THEORETICAL BACKGROUND

Anthropomorphism

Anthropomorphism occurs when people attribute essential human characteristics such as minds, intentions, and emotions to nonhuman objects (Gray, Gray, & Wegner, 2007; Waytz et al., 2014; Epley, Waytz, & Cacioppo, 2007). Many early studies of anthropomorphism focused on its antecedents. Humanlike characteristics (i.e., eyes, nose, and four limbs), movements (i.e., eye glance and unpredictability), and voice have been found to affect the extent to which people perceive the object as human (Hinds, Roberts, Jones, 2004; Bailenson, Blascovich, Beall, & Loomis, 2001; Lee, 2010). Other researchers identified that people's need for belonging and the motivation to understand their environment can drive awareness of human characteristics (Epley, Waytz, & Cacioppo, 2008; Epley, Waytz, Cacioppo; 2007).

Compared to the interaction with regular objects, numerous researchers

suggested that interaction with anthropomorphized objects lead to positive attitudes and evaluations. When objects were anthropomorphized, people liked, felt pleasure, and enjoyed the interaction more (Lee, 2009; Qiu & Benbasat, 2009; Waytz et al., 2014). Such consequences positively shaped people's perception and behavioral intentions like perceived quality, performance, trustworthiness, and usage intentions (Waytz et al., 2014; Aggarwarl & McGill, 2007; Chandler & Schwarz, 2010; Tam et al., 2013). More interestingly, once people perceive an object as human, they tend to interact with it as if they are interacting with other people. This imply that principles of interpersonal interaction can be applied to the interaction with anthropomorphized objects. For example, people interacting with a computer with a female voice thought the information it provided was more credible when the topics were related to feminine subjects (i.e., love and relationships) than masculine subjects (i.e.. technology) (Nass, Moon, & Green, 1997). Also, people who were primed to feel powerful, have perceived more control and thus less risk toward an anthropomorphized risk-bearing object than those who were primed to be powerless (Kim & McGill, 2011). Moreover, people who perceived the computer as similar as themselves rated better evaluation of the computer, confirming the application of the similarity principle to human and nonhuman interaction (Nass & Lee, 2001).

Hence, anthropomorphism of entities should be done with care as it may

lead to unintended or undesired consequences. It was found that people feel greater embarrassment in front of an anthropomorphized machine when they were asked to take off clothes and became more reluctant to undress (Bartneck et al., 2010). Moreover, compared to people who had little tendency to anthropomorphize animals, people who tend to anthropomorphize animals had greater concern for animals and thus lower appetite for meat (Niemyjska, Canarero, Byrka, & Bilewicz, 2018). Furthermore, in case of product wrong, promoting humanlike brand personality resulted in unfavorable evaluation from the consumers who believed in personality stability (Puzkova, Kwak, Rocereto, 2013). Along the same lines, when people interact with anthropomorphized products that they have to cause damage to, they will face similar psychological process as if they are causing harm to actual people, generating negative responses.

Mind Perception and Empathy

According to previous research of mind, the perception of mind is the key to moral perception toward an object (Gray, et al., 2007; Gray, Young, & Waytz, 2012). Viewing an object as a "moral patient," a moral being that is capable of suffering and pain, would cause people to apply the moral rules when they interact with it. The mind perception of an object would increase their respect and carefulness toward a nonhuman entity. Then in cases where consumers have to

cause damage to the anthropomorphized product (i.e., cutting a cake, rubbing a bar soap, squeezing a cleansing foam, and stepping on a rug), negative responses may arise.

Empathy is an "emotional response that is focused more on another person's situation or emotion than on one's own" (Albiero, Matricardi, Speltri, & Toso, 2009; see review: Cuff, Brown, Taylor, & Howat, 2014). It is known to be situated in the early stages leading to prosocial behaviors such as helping (Cuff et al., 2014). As a result, many studies examined factors affecting the extent to which people empathize. Diverse studies focused on empathy as an innate trait and tried to understand it through individual differences such as gender and developmental factors (Eisenberg & Morris, 2001; Derntl, Finkelmeyer, Eickhoff, Kellermann, Falkenberg, Schneider, & Habel, 2010) However, other research note the importance of situational factors that can stimulate empathy. For example, factors such as similarity of observer and the target and perceived need of the observed opponent may play elicit empathy (Eklund, Adersson-Straberg & Hansen, 2009; Lishner, Batson, & Huss, 2011).

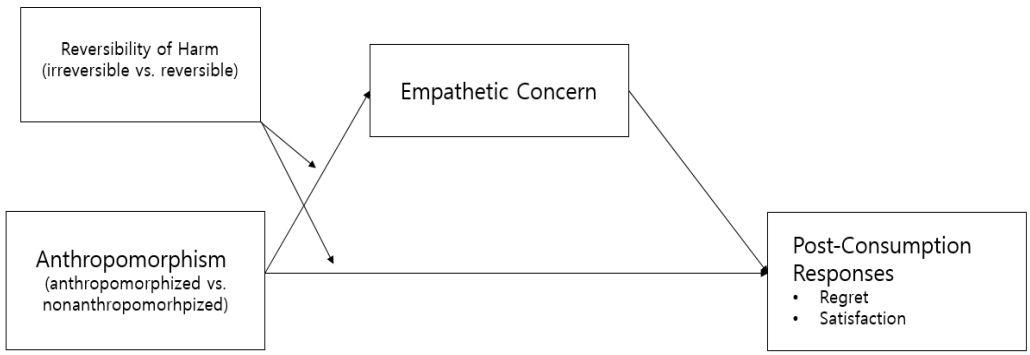
While the end state of empathy may be affective, feelings of empathy is aroused either automatically or through cognitive understanding of what the other is experiencing (Singer, Seymourn O'Doherty, Kaube, Dolan, & Frith, 2004; Besel & Yuille, 2010). One can automatically feel empathy toward someone through

emotional cues like facial expressions but people can cognitively go through a process of perspective taking or taking a perspective of the other (Besel & Yuille, 2010; Cuff et al., 2014). People are able to intentionally feel empathy through perspective taking and imagination even without any stimuli (De Greck, Wang, Yang, Wang, Northoff, & Han, 2012). It was also found that people felt greater empathetic concern toward the target when they were asked to adopt the target's perspective rather than take an objective perspective (Davis, Soderlund, Cole, Gado, Kute, Myers, & Wiehing, 2004). Not just presence of the other person, but also "emotional stimuli" such as verbal statements and fictitious person can evoke empathy (Blair, 2005; Decety & Jackson, 2004; Singer & Lamm, 2009).

Then again, in order to experience what other is feeling, one must be able to perceive the opponent's capability to feel emotions. One needs to be able to perceive that the opponent can suffer and experience pain (Gray et al., 2007; Gray et al., 2012). Perception of human characteristics must precede in order for someone to go through perspective taking and feel empathy. Therefore, anthropomorphism of a nonhuman objects will activate better perspective taking. In situations where consumers have to cause damage to the products' anthropomorphic forms during consumption, the heightened mind perception of products will render consumers to feel greater empathetic concern toward them as they consume such objects.

FIGURE 1

Conceptual Model



Irreversibility of Damage

According to emotion regulation, people have strong desires to amplify, maintain, or reduce an emotion based on its valence (Gross & Ross, 2007; Lazarus, 1991; Fredrickson, Mancuso, Branigan, & Tugade, 2000; Baumeister, 2002). Specifically, people would try to maintain positive emotions and mitigate negative emotions (Lazarus, 1991; Fredrickson et al., 2000; Baumeister, 2002). As a result, people take several coping strategies to handle negative feelings they experience by shifting their perception or engaging in behaviors (Gross & John, 1998; Kemp & Kopp, 2011; Wansink, Cheney, & Chan, 2003) For example, people who are in negative emotional state have been found to have greater likelihood of impulsive purchase and are more prone to purchase hedonic goods (Kemp & Kopp, 2011; Wanswink et al., 2003). Similarly, people who felt guilt have increased desire to amend the harm they have conducted or even desire to wash when they have done

a misconduct (De Hooge, Zeelenberg, & Breugelmans, 2007; Nelissen, Dijker, & De Vries, 2007; Zhong, Liljenquist, 2006).

However, in situations where consumers cannot cope by performing certain actions, the negativity will prevail. Some early researchers have suggested that outcomes that are irreversible will cause greater regret (Engel, Blackwell, Miniard, 1995; Landman, 1993). Based on these suggestions, empirical studies have found moderating role of irreversibility of outcome (Tsiros & Mittal, 2000; Patrick, Lancellotti, & Demello, 2009). Therefore, when consumptions require people to cause irreversible damage to products like cakes or soap, people will face difficulty of regulating the unfavorable affective state, experiencing more intense negativity.

$\mathbf{H_1}$: Consumption that involves damage to the anthropomorphic product form, will cause negative impact on consumer's post-consumption responses

$\mathbf{H_{1a}}$: Specifically, consumers of highly anthropomorphized products will have higher regret when consumption entails irreversible damage (vs. reversible damage) to the anthropomorphic form

$\mathbf{H_{1b}}$: Consumers of highly anthropomorphized products will have lower satisfaction when consumption entails irreversible damage (vs. reversible damage) to the anthropomorphic form

STUDY 1

The author conducted the first study to test H_1. It utilized products within the cleansing product category to prevent alternative explanation. A pretest was initiated prior to Study 1 to check manipulations.

Participants, Design, and Procedure

In exchange of $ .80, hundred and twenty participants were gathered through Amazon MTurk. The participants were instructed to read a scenario about a purchase of a product and look at a photo of the product with a short description of it. Then they were asked to imagine consuming the presented product and were also given a picture showing the end state after consumption to aid their imagination. A design of a cloud was used as a nonhuman product design. After that, they evaluated what they felt during and after their imagined consumption. Finally, the participants answered some demographical questions.

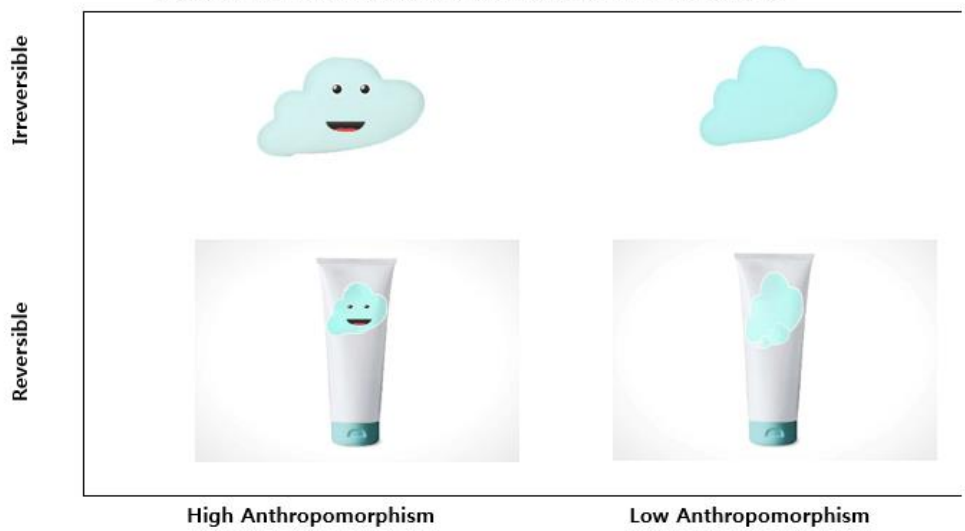
Stimulus Materials and Pretest

For reversible damage condition, a picture of a cleansing foam was introduced and for irreversible damage condition, a picture of a bar soap was presented (Figure 2). Anthropomorphism was manipulated by using facial expressions (i.e., eyes and mouth), a name, and first person (i.e., “I am Wonda”).

Also, verbs relating to human characteristics such as “help,” “love,” “fight,” and “hurt” were used to describe the product (Puzakova et al., 2013; Kim & McGill, 2011). The product for less anthropomorphized condition had no facial expressions, and it was described without a name and with an objective pronoun “it.” Objective verbs was used to describe the product (Appendix).

FIGURE 2

Study 1: Manipulations of Anthropomorphism and Reversibility



To check the manipulation of anthropomorphism and reversibility of the stimuli, a pretest was conducted. Out of hundred and ten participants, four people who failed the attention check questions were deleted, resulting in hundred and six participants (55 male; M_{age}= 35) For manipulation check of anthropomorphism the participants rated the extent to which they agree with the following three statements: “It seems almost as if it (1) can feel (2) has own beliefs and desires (3)

has a mind of its own" (Puzakova et al., 2013; Waytz et al., 2014). Also, to rule out alternative explanations, the participants also rated the extent to which the product was attractive and likable (1 = not at all, 7 = extremely). In addition, they rated how much effort they thought were put into making the product (1 = none at all, 7 = quite a lot).

2 (anthropomorphism: high vs. low) x 2 (reversibility: irreversible vs. reversible) analysis of variance was conducted to check perception of anthropomorphism and reversibility. As predicted, participants in the high anthropomorphized condition rated the product to be more anthropomorphized than the low anthropomorphized product (α = .94; M_{hi}= 4.57, M_{low}= 2.47; $F(1, 102) = 34.38$, $p < .01$). Also, participants in the irreversible condition (i.e., soap) rated lower reversibility than the reversible condition (M_{irre} = 3, M_{re} = 5.48; $F(1,102) = 54.19$, $p < .01$). On the other hand, there were no significant effects on other control variables (p's > .1).

Measures

The participants rated three items for regret (α = .95). They were asked to rate the extent to which they agree to the following sentences: (1) "I feel that if I could do it over, I will choose a different one" (2) "I feel that I could have made a better choice by buying a different one" (3) "I feel bad about buying this item"

(Bonifield & Cole, 2007). For control measures, they also rated the two measures for cuteness used in the pretest (r_{cute} = .91, p < .001), their general liking of clouds, and their general liking of character products.

Results

Regret

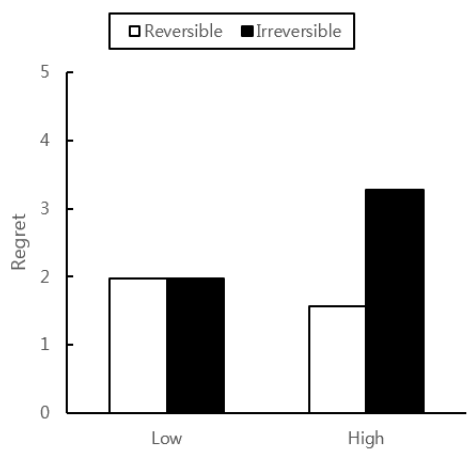
The author ran 2 (anthropomorphism: high vs. low) x 2 (reversibility of damage: irreversible vs. reversible) analysis of variance on regret entering cuteness and the general liking of clouds and character products as covariates. In the analysis with regret as the dependent variable and the three covariates, the results indicated that only the main effect of general liking of character products was significant, thus analysis was done again only adjusting for it. According to the analysis, there was significant main effect of reversibility, indicating that people who consumed product with irreversible damage had greater regret than those who consumed product with reversible damage (M_{irre} = 2.63, M_{re}= 1.77; F(1, 115) = 10.08, p < .01). As predicted, the interaction of reversibility and anthropomorphism was significant (F(1, 115) = 10.42, p <.01; Figure 3).

Specific planned contrast revealed that people who consumed highly anthropomorphized product felt greater regret when the product involved irreversible damage than when it involved reversible damage (M_{irre} = 3.28, M_{re}=

1.57; $F(1, 155) = 20.9$, $p < .001$). However, for participants who viewed a product with low anthropomorphism, there was nonsignificant differences on regret regardless of the reversibility of the damage ($F(1, 115) = 1.5$, $p > .1$). The other pair of contrast showed that participants who imagined to consumed products involving irreversible damage had significantly greater regret if the product was highly anthropomorphized than less anthropomorphized ($M_{hi} = 3.28$, $M_{low} = 1.98$; $F(1, 115) = 13.63$, $p < .001$). However, there was no significant effect of the level of anthropomorphism on regret for those who were presented products with reversible damage ($F(1, 115) = 1.07$, $p > .1$).

Figure 3

Study 1: Interaction Effect betweeen Anthropomorphism and Reversibility of Damage on Regret



Discussion

Study 1 confirmed the first hypothesis predicting significant interaction

effect between anthropomorphism and reversibility of the damage on regret. Specifically, people tend to experience greater level of regret when they consume anthropomorphized goods in which imposed damage cannot be reversed. However, reversibility of the damage did not have a significant impact for products which were not anthropomorphized. The study also found unexpected main effects of reversibility on regret and satisfaction.

H_2 : The interaction effect of anthropomorphism and reversibility of damage on post-consumption responses will be mediated by empathetic concern.

H_{2a} : Specifically, when consumption damage is irreversible, consumers using highly anthropomorphized product (vs. less anthropomorphized) will have higher empathetic concern therefore having higher regret

H_{2b}: When consumption damage is irreversible, consumers using highly anthropomorphized product (vs. less anthropomorphized) will have lower empathetic concern therefore having lower satisfaction

STUDY 2

There were mainly four objectives for Study 2. First was to replicate the

findings of Study 1 to different product categories to offer more practical implications for managers. Second, was to include consumer satisfaction as another post-consumption response. Third, Study 2 discovers the role of empathetic concern as the psychological explanation of why the interaction between anthropomorphism and reversibility of damage cause negative post-consumption responses. Finally, this study checks whether enjoyment may explain the process of such effects.

It is worthwhile to analyze the potential positive route to post-consumption responses as people may think the product is just a product despite the manipulations of anthropomorphism. Unlike real interpersonal interaction, the current study investigates the unique circumstances when people cause damage to nonliving objects. Moral disengagement is the process in which people distinguish objects to either be out of the scope of their moral standards (Opotow, 1990; Haslam, 2006; Haque & Waytz, 2012). Disengaging can occur when people enjoy play violent video games. They consider game avatars as irrelevant with their morality and are able to enjoy the game despite the violence (Hartman & Vorderer, 2010, Krakowiak & Tsay-Vogel, 2011). Therefore, checking for a positive pathway through enjoyment would allow the author to capture bot negative and positive responses.

Participants, Procedure, and Measures

Hundred and twenty participants were gathered from Amazon Mturk with $ .80 reward. Participants in Study 2 first viewed a picture of a product and read a brief description about the product. Then they were instructed to imagine that they have purchased the product and consumed it. Another picture showing what the product may look like after the usage. Then they answered several questions about the consumption experience as well as brief demographic questions.

Stimulus Materials and Pretest

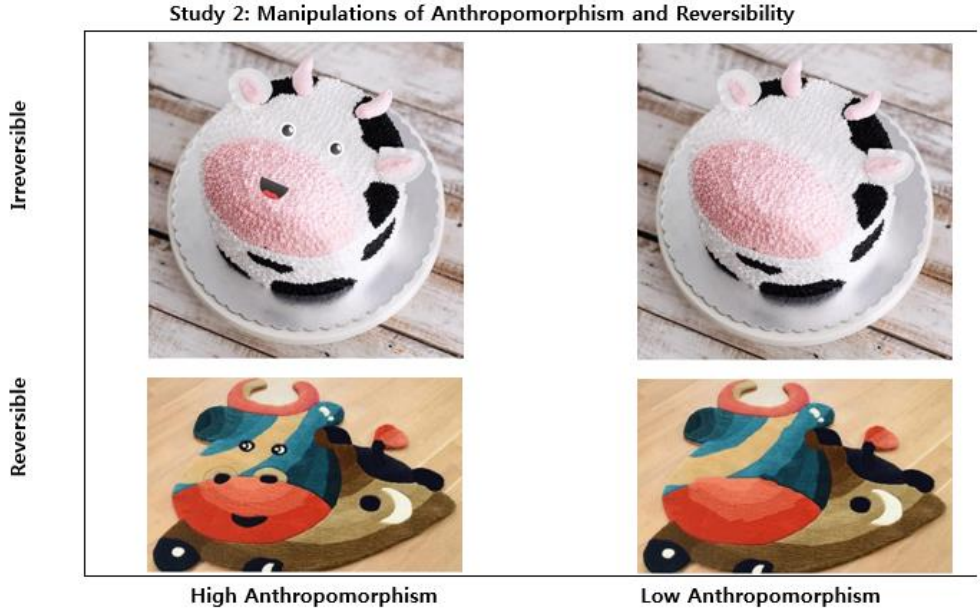
Four product pictures were developed for the study. For reversible damage condition, a picture of a rug was presented while for irreversible damage condition a picture of a cake was presented (Figure 4). A cow was selected as a nonhuman product design for each stimulus. Similarly with study 1, highly anthropomorphized product had facial expressions (e.g., eyes, nose, and mouth), and it was introduced with a name and first person (e.g., “I am Mia,” “me”). Also, the product description included humanlike verbs such as “love,” “eating,” “hurt,” and “help.” (Puzakova et al., 2013; Kim & McGill, 2011). The product for low anthropomorphized condition had no facial expressions, and it was described without a name and objective pronoun “it.” Objective verbs were used to describe the product (Appendix).

In a pretest of ninety participants, seven were deleted as they failed

attention check questions. Thus, eighty three participants (50 male, M_{age} = 33), participants saw the product and its description. Then on a seven-point Likert-type scale (1 = "strongly disagree," 7 = "strongly agree") the participants rated the extent to which they agree with the three items of anthropomorphism (i.e., same as Study 1; α = .95). Also, they rated the same manipulation check for reversibility of the damage. In addition, the same control variables measured in Study 1 was asked (i.e., attractive, hedonic, and effort). The same two items for cuteness were measured (r_{cute} = .62, p < .01).

FIGURE 4

Study 2: Manipulations of Anthropomorphism and Reversibility



2 (anthropomorphism: high vs. low) x 2 (reversibility: irreversible vs. reversible) analysis of variance was conducted to check perception of

anthropomorphism and reversibility. As predicted, participants in the high anthropomorphized condition rated the product to be more anthropomorphized than the low anthropomorphized product (M_{hi} = 4.31, M_{low} = 2.3; $F(1, 79) = 24.86$, $p < .001$). Also, participants in the irreversible damage condition (i.e. cake) rated lower reversibility (M_{irre} = 2.27, M_{re} = 5.87; $F(1,79) = 101.65$, $p < .001$). There was a significant main effect of anthropomorphism on cuteness (M_{hi} = 5.44, M_{low} = 4.68; $F(1,79) = 6.99$, $p = .01$) and significant main effect of reversibility (M_{irre} = 4.73, M_{re} = 5.39; $F(1,79) = 5.182$, $p < .05$). Also, there was significant main effect of anthropomorphism on attractiveness (M_{hi} = 5.83, M_{low} = 4.87; $F(1,79) = 10.60$, $p < .01$). Therefore, the level of cuteness and attractiveness were included as covariates in the analyses for Study 2. On the other hand, there were no significant effects on other control variables (p's > .1).

Measures

The participants were asked to indicate their empathetic concern with three items: "When I was consuming the product, I felt (1) sympathetic (2) compassionate (3) softhearted; α = .97) on a seven-point Likert-type scale (1 = "strongly disagree," and 7 = "strongly agree") (Batson, Eklund, Chermok, Hoyt, & Ortiz, 2007). They also indicated for regret (i.e., same as Study 1; α = .97) and rated three items of satisfaction (α = .97) in seven-point Likert-type scale, rating the extent to which they felt: (1) "satisfied with the consumption" (2) "content with the

consumption" (3) "pleased with the consumption." (Bui, Krishen, & Bates, 2009).To check for possible positive route, they were also asked to indicate the level of enjoyment (α = .89) they felt for the following three items: "Consuming the product was (1) enjoyable (2) fun (3) interesting". Finally, they rated attractiveness and cuteness of the product (r_{cute}= .93, p < .01). Finally, they also measured their general liking of a cow and character products.

Results

Empathetic Concern

2 (anthropomorphism: high vs. low) x 2 (reversibility of damage: irreversible vs. reversible) ANOVA on empathetic concern was conducted adjusting for the four control variables (i.e., attractiveness, curtness, general liking of cows, and general liking of character products). However, the effect of the covariates were insignificant thus they were dropped out from the following analysis. The results revealed significant main effect of anthropomorphism (M_{hi} = 3.95, M_{low} = 2.27; F(1, 116) = 27.93, p < .001) and significant main effect of reversibility (M_{irre} = 3.42, M_{re} = 2.8; F(1, 116) = 3.89, p = .05). More importantly, the interaction between anthropomorphism and reversibility was significant (F(1, 116) = 6.18, p = .01). Follow up planned contrasts found that

participants who viewed highly anthropomorphized product had greater empathetic concern toward the product involving irreversible damage than reversible damage (M_{irre} = 4.65, M_{re} = 3.24; F(1, 116) = 9.32, p < .01). However, for participants who viewed the low anthropomorphized products there were insignificant differences regardless of whether they imagined to consume products with irreversible or reversible damage (F(1, 116) = .14, p > .5). Other pair of contrasts showed that people who viewed product with irreversible damage had significantly higher empathetic concern when it was highly anthropomorphized than less anthropomorphized (M_{hi} = 4.65, M_{low} = 2.19; F(1, 116) = 30.07, p < .001). Furthermore, participants who viewed a product with reversible damage had higher empathetic concern when it was highly anthropomorphized than not anthropomorphized (M_{hi} = 3.24, M_{low} = 2.36; F(1, 116) = 3.93, p = .05).

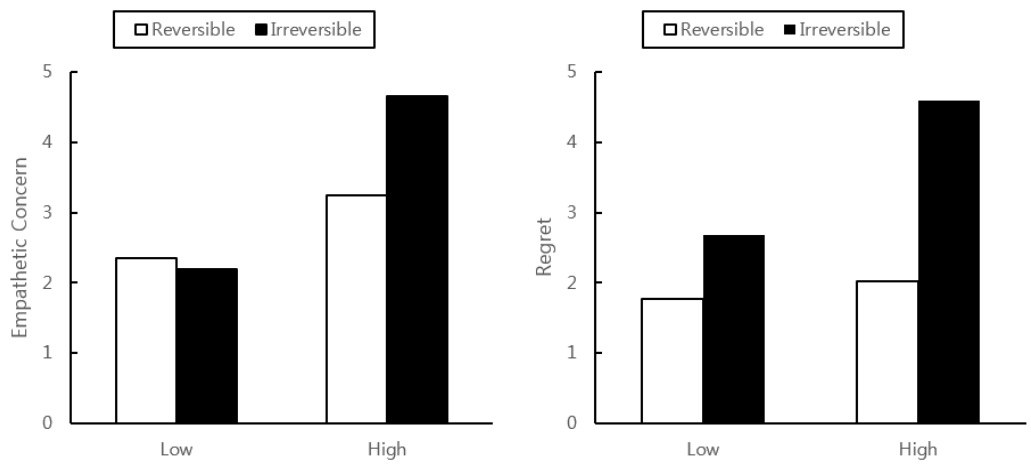
Regret

2 (anthropomorphism: high vs. low) x 2 (reversibility of damage: irreversible vs, reversible) analysis of variance on regret adjusting for four control variables found that only attractiveness had significant effect (F(1, 115) = 20.7, p < .001). Thus, only attractiveness was entered as covariate in the following analysis. The model found significant main effect of anthropomorphism (M_{hi} = 3.64, M_{low} = 1.9; F(1, 115) = 34.92, p < .001) and significant main effect of reversibility (M_{irre} = 3.31, M_{low} = 2.23; F(1, 115) = 12.98, p < .001). More importantly, there was a

significant interaction effect between anthropomorphism and reversibility (F(1, 155) = 7.8, p = .01; Figure 5).

FIGURE 5

Study 2: Interaction Effect between Anthropomorphism and Reversibility on Empathetic Concern and Regret



As predicted, the planned contrast analysis showed that participants who were presented with highly anthropomorphized product had higher level of regret when the damage was irreversible than when it was reversible (M_{irre} = 4.59, M_{re} = 2.68; F(1, 115) = 20.36, p < .001). However, there was no significant differences for participants who saw less anthropomorphized product regardless of the reversibility of damage (F(1, 155) = .34, p > . 5). On the other hand, participants who viewed products with irreversible damage had higher regret when the product was highly anthropomorphized than less anthropomorphized (M_{hi} = 4.59, M_{low} = 2.68; F(1, 115) = 39.13, p < .001). Unexpectedly, for participants who viewed

product with reversible damage, they had higher regret when the product was highly anthropomorphized than less anthropomorphized (M_{hi} = 2.68, M_{low} = 1.77; $F(1, 115) = 4.53$, $p < .05$).

Satisfaction

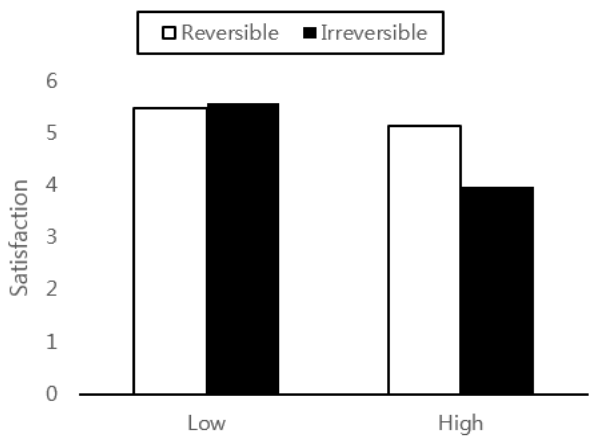
Similarly, 2 (anthropomorphism: high vs. low) x 2 (reversibility: irreversible vs, reversible) analysis of variance on satisfaction was conducted, adjusting the four control variables. However, only attractiveness and general liking of cows had significant main effect, so the two were included in the following analysis. According to the analysis, significant main effect of anthropomorphism on satisfaction was found (M_{hi} = 4.57, M_{low} = 5.55; $F(1, 114) = 16.98$, $p < .001$). Also, there was significant main effect on reversibility of damage (M_{irre} = 4.79, M_{re} = 5.32; $F(1, 114) = 4.92$, $p < .05$). There was a significant interaction between anthropomorphism and reversibility of the damage ($F(1, 114) = 7.28$, $p < .01$; Figure 6). According to the planned contrast analysis people who were presented with highly anthropomorphized product had lower satisfaction if the damage was irreversible (M_{irre} = 3.98, M_{re} = 5.16; $F(1, 114) = 12.04$, $p = .001$).

However, there was no significant effect of reversibility of the damage when people viewed products that had low level of anthropomorphism ($F(1, 114) = .11$, $p > .5$). The other pair of contrasts showed that people had lower satisfaction

when the product involving irreversible damage was highly anthropomorphized (M_{hi} = 3.98, M_{low} = 5.6; $F(1, 114) = 23.93$, $p < .001$). On the other hand, when people viewed product with reversible damage, there was no significant differences on satisfaction depending on the level of anthropomorphism ($F(1, 114) = .94$, $p > .1$).

Figure 6

Study 2: Interaction Effect between Anthropomorphism and Reversibility on Satisfaction



Moderated Mediation Analyses

To test whether empathetic concern mediates the interaction effect between anthropomorphism and reversibility of damage on regret and satisfaction, mediated moderation analysis was conducted using Hayes' PROCESS macro model 8 (Hayes, 2017). Anthropomorphism (0 = low, 1 = high) was entered as independent variable, reversibility of damage (0 = reversible, 1 = irreversible) was used as the moderator, regret and satisfaction was each used as the dependent variable, and

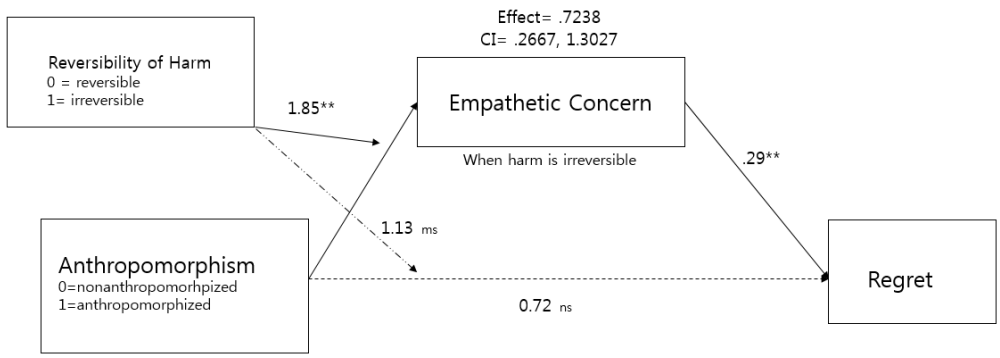
attractiveness was adjusted (Figure 7). The test was conducted with 95 percent confidence intervals and 5000 bootstrap samples. The indirect effects would be significant if the confidence intervals do not include 0.

As predicted in H_{2a}, the moderated mediation for anthropomorphism → empathetic concern→regret was significant (CI = .1192, 1.0899). Conditional interaction effect of anthropomorphism and reversibility on regret was significant when the damage was irreversible (95%, CI= .2667, 1.3027) but it was not significant for reversible products (95%, CI = -.0570, .5715) To analyze the moderated mediation step by step, the interaction between anthropomorphism and reversibility on empathetic concern was significant (β = 1.85; t(115) = 2.88, p < .001). Specifically, interaction between anthropomorphism and reversibility was significant for product involving irreversible damage (β = 2.5; t(115) = 5.61, p < .001) but not significant for product entailing reversible damage. Also, the interaction of anthropomorphism and reversibility on regret was marginally significant when empathetic concern was entered as mediator (β = 1.13; t(114) = 1.92, p < .0579). Specifically, the interaction was significant for products with irreversible damage (β = 1.85; t(114) = 4.18, p < .001) but the interaction was not significant for products with reversible damage. However, unlike H_{2b}, that predicted the moderated mediation on satisfaction, there was no significant moderated mediation as the confidence intervals included 0. Moreover, the analysis

entering enjoyment as the mediator was also not significant, ruling out potential positive route.

FIGURE 7

Study 2: Statistical Framework for Moderated Mediation Analysis on Regret



ns = not significant
ms = marginally significant
*: p < .05
**: p < .001

Discussion

The findings of Study 1 were replicated in Study 2, using product category of food and living products. This suggests possibility of future research to build on to the conceptual framework of the current study and reach theoretical agreement. Also, the role of empathetic concern as the mediating variable to the interaction between anthropomorphism and reversibility of damage was discovered. The findings supports the hypothesis that anthropomorphism of products endorse better perspective taking, causing greater regret.

However, such moderated mediation was confirmed to be not significant

for satisfaction. The results may have been found due to the ineffectiveness of conducting the study through survey where participants mainly had to rely on their imagination rather than actual experience. On the other hand, consumers may actually go through the process of rationalization to refrain from feeling stronger negative consequences. Although consumers feel greater regret, they may try to justify that their purchase choice was satisfying to not feel bad about oneself. Finally, despite the fact that people may rather enjoy interacting with anthropomorphized products, a possible positive route of enjoyment did not turn out to have mediating role. Such finding is interesting as previous research often claimed that anthropomorphism deliver higher enjoyment or positive affect.

General Discussion

Previous research on anthropomorphism have found how it render human to object relationship as similar as interpersonal relationships. However, most of those research focused on its positive impact, eliciting more positive connectedness, positive affect, evaluation, and purchase intentions (Waytz et al., 2014; Aggarwarl & McGill, 2007; Chandler & Schwarz, 2010; Tam et al., 2013). Along with several research suggesting possible setbacks of anthropomorphism, through two studies the author have found that anthropomorphism may back fire when consumption involves irreversible damage. Specifically, Study 1 have found that people feel

greater regret and lower satisfaction when they consume highly anthropomorphized products that face irreversible damage. Also, Study 2 further elaborates this effect and suggests that empathetic concern felt by the consumers explains the process.

Theoretical Implications

This study contributes to the research of anthropomorphism. Various studies of human computer interaction and marketing have mainly discovered how anthropomorphism can aid or promote positive consequences to people. However, this research highlights the importance of potential negative results from anthropomorphism, especially when the consumption requires consumers to cause damage to the product. Also, the research again confirms that anthropomorphism influence not just evaluation of the product, but also to consumers' emotional responses. The elicited regret may lead to negative evaluation in the long-term. Furthermore, the current research provides more comprehensive understanding as it stresses the effects of anthropomorphism to people's post-consumption responses. Most marketing researches dealing with anthropomorphism, addressed how anthropomorphism change people's attitudes or evaluation after just simple encounter with advertisements or products. Therefore, this research incorporates the idea of "value-in-use" to understanding how consumers realize meaning or value from product consumption (Vargo & Lusche, 2004). Finally, this research

elaborates to empathy and perspective takin literatures, suggesting that people can even take perspective of nonhuman objects or beings.

Managerial Implications

This research provides specific decision guide to marketing managers regarding product design. Although adding anthropomorphism cues generally can elicit positive responses, the research implies that anthropomorphism of products that involve some sort of damage should be avoided. On the other hand, companies may implement anthropomorphism through design and text to objects that they wish to preserve. Along the same lines, this research imply that anthropomorphism may play an important role in promoting eco-friendly behaviors, by making people more sensitive toward causing damage to nature.

Limitations and Further Research

The current research have several limitations which may need improvements in further research. First, both Study 1 and Study 2 were conducted through online survey. This may be problematic as participants can only rely on their imagination and past consumption experiences rather than the stimuli given. Further research should be conducted in diverse methods such as making video stimuli rather than using just pictures, recruiting participants to the lab, or conducting field studies for more realistic consumption experience. Such vivid manipulation methods may

even lead to behavioral variables such as repurchase intentions and hesitation to consumption.

Furthermore, the two studies did not include a control condition for reversibility of damage and only dealt with products that have at least some sort of damage. However, if there was a control condition in which a product with no damage at all, there may have been a significant influences on enjoyment. Therefore, future studies may also include a product that are free from any type of damage to check whether anthropomorphism does in fact elicit positive affect. In addition, unlike the current research, future researchers should analyze how positive responses of anthropomorphism decrease compared to before and after consumption. Study 1 and Study 2 measured the post-consumption responses using distinctive measures to capture psychological consequences. However, it would be more interesting to understand how the once positive effects of anthropomorphism change due to the experience of causing irreversible damage to the product.

Also, the current study failed to have rule out the effect of anthropomorphism and reversibility of damage on cuteness and attractiveness. This may be problematic even though they were adjusted as covariates in the analysis. Thus, careful development of stimuli with the advice from design experts may allow stimuli that only affect the level of anthropomorphism and reversibility. For future studies, one can even explore the interaction effect of cuteness or attractiveness. As

cuteness may also affect people's level of empathetic concern, one may develop diverse conditions depending on the degree of cuteness or attractiveness to see whether such effect cause stronger negative consequences.

Finally, there future researchers could explore condition in which people actually prefer and obtain greater positive responses from destroying anthropomorphized products. As one of the main reasons why people play violent games is to relieve stress and gain excitement, people under great stress may enjoy causing irreversible harm to anthropomorphized products. Also, even though people may have felt greater regret, there may be positive consequences, such as greater intention to word of mouth.

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Appendix

Manipulations of Anthropomorphism and Reversibility- Pretest 1/Study 1

High Anthropomorphism, Irreversible

Imagine that you went to a store and have bought a soap that looks like a character called, Wonda. Wonda looks like the picture below. Here is some description about her.

I am Wonda. I love to clean anywhere that is dirty. I fight against germs that can make you sick. Please keep me in a dry place so that I don't get hurt when I rest.

Now imagine that you come home and took out Wonda. You placed Wonda on the soap plate and washed your hands with her whenever your hands got dirty. By the time you have used Wonda for a long time, she would probably look like the picture below.

Low Anthropomorphism, Irreversible

Imagine that you went to a store and have bought a soap that looks like a cloud. The soap looks like the picture below. Here is some description about it.

This is a soap. It cleans anywhere that is dirty. It reduces germs that can make people sick. Please keep it in a dry place so that it doesn't erode when not used.

Now imagine that you came home and took it out. You placed it on the soap plate and washed your hands with it whenever your hands got dirty.

By the time you have used the soap for a long time, it would probably look like the picture below.

High Anthropomorphism, Reversible

Imagine that you went to a store and have bought a cleansing foam that has a cloud character called Wonda on it. Wonda looks like the picture below. Here is some description about her.

"I am Wonda. I love to clean anywhere that is dirty. I fight against germs that can harm your skin. Please close the lid so that I don't get hurt when I rest."

Now imagine that you come home and took out Wonda. You placed Wonda beside a sink and washed your face with her whenever you needed to. After washing with Wonda for a while, she would probably look like the picture below.

Low Anthro, Reversible

Imagine that you went to a store and have bought a cleansing foam with a cloud design on it. The cleansing foam looks like the picture below. Here is some description about it.

This is a cleansing foam. It cleans anywhere that is dirty. It reduces germs that can harm your skin. Please close the lid so that it won't get contaminated when not used.

Now imagine that you come home and took out the cleansing foam. You placed it beside a sink and washed your face with it whenever you needed to. After washing with the cleansing foam for a while, it may look like the picture below.

Manipulations of Anthropomorphism and Reversibility- Pretest 2/Study 2

High Anthropomorphism, Irreversible

Imagine that you went to a bakery and have bought a cake that looks like a cow character called, Mia. Mia looks like the picture below. Here is some descriptions about Mia.

"I am Mia. I love eating sweets and I'm quite chubby. I help you feel better when you are upset. Please be gentle with me when you take me home and keep me in a cool place so that I won't get hurt."

Now imagine that you came home and is going to eat it. You took it out, brought a knife, and cut it into a slice. Then, you took the slice and ate it.

Low Anthropomorphism, Irreversible

Imagine that you went to a bakery and have bought a cake that looks like a cow. The cake looks like the picture below. Here is some description about the cake.

This is a cake. It is sweet and quite rounded. It makes people feel better when they are upset. Please be gentle with it when you take it home and keep it in a cool place so that it won't break

Now imagine that you came home and is going to eat it. You took it out, brought a knife, and cut it into a slice. Then, you took the slice and ate.

High Anthropomorphism, Irreversible

Imagine that you went to a store and have bought a rug with a cow character called, Mia. Mia looks like the picture below. Here is some description about her.

"I am Mia. I love soft things and I'm quite fluffy. I help you feel comfortable when you are tired. Please don't wash me with hot water so that I won't get hurt!"

Now imagine that you come home and is going to step on the rug. You took it out and stepped on it. Then, you walked out of it.

Low Anthro, Irreversible

Imagine that you went to a store and have bought a rug with a cow design. The rug

looks like the picture below. Here is some description about it.

This is a rug. It is soft and fluffy. It makes people feel comfortable when they are tired. Please don't wash it with hot water so that it won't get ruined.

Now imagine that you come home and is going to step on the rug. You took it out and stepped on it. Then, you walked out of it.

Measures

Anthropomorphism

Likert-type scale: 1 = "strongly disagree," and 7 = "strongly agree"

- It seem almost as if it can feel
- It seem almost as if it can has own beliefs and desires
- It seem almost as if it can has mind of its own

Reversibility

Likert-type scale: 1 = "strongly disagree," and 7 = "strongly agree"

- After consuming the product, it can return back to its original shape.

Attractiveness

Likert-type scale: 1 = "not at all," and 7 = "very much"

- Attractive

Cuteness

Likert-type scale: 1 = “not at all,” and 7 = “very much”

- Cute
- Adorable

Effort

Likert-type scale: 1 = “non at all,” and 7 = “very much”

- How much effort you think went into making the product?

Hedonic

Likert-type scale: 1 = “not at all,” and 7 = “very much”

- How hedonic the product would be during usage?

Likable

Likert-type scale: 1 = “not at all,” and 7 = “very much”

- Likable

Purchase Intentions

Likert-type scale: 1 = “definitely would not buy,” and 7 = “definitely would buy”

- How do you feel about buying the product in the near future?

Empathetic concern

Likert-type scale: 1 = “not at all,” and 7 = “very much”

- When you were consuming the product, how much did you feel ____ toward it?
    - sympathetic
    - compassionate

- softhearted

Regret

Likert-type scale: 1 = “strongly disagree,” and 7 = “strongly agree”

- I feel sorry for choosing this product
- I regret buying this product
- I should have chosen an alternative product

Satisfaction

Likert-type scale: 1 = “not at all,” and 7 = “very much”

- To what extent would you feel satisfied with your purchase decision?
- To what level would you feel content with your purchase decision?
- To what degree would you feel please with your purchase decision?

Enjoyment

Liker-type scale: 1 = “not at all,” and 7 = “very much”

- Enjoyable
- Fun
- Exciting

국문초록

의인화, 즉 인간이 아닌 대상에게 인간의 정신과 감정을 부여하는 현상에 대한 연구들은 사람들이 의인화로 하여금 인간이 아닌 대상을 마치 사람을 대하듯이 다루게 된다고 주장한다. 게다가 기존 의인화 연구들은 주로 의인화가 사람들의 태도와 평가에 끼치는 긍정적인 영향에 대해 초점을 두었다. 그러나 본 연구는 소비를 하는 과정에서 의인화 제품 형상을 훼손시켜야 하는 상황에서 의인화가 소비자에게 부정적인 영향을 야기할 수 있음을 밝히고자 한다. 저자는 두 실험을 통해 다음과 같은 결과를 도출한다. 첫 째, 소비자들은 의인화된 제품 형상에게 돌이킬 수 없는 훼손을 입혀야 하는 경우 (i.e., 비누와 케이크), 복구가 가능한 훼손을 가할 때에 비해 (i.e., 클렌징 폼과 러그) 후회를 느끼는 정도가 높고 만족도를 느끼는 정도가 낮다. 둘 째, 후회에 미치는 부정적 영향은 소비할 때 느낀 공감으로 인해 야기되고 만족도에 미친 부정적 영향을 이로 인해 매개 되지 않는다.

주요어: 제품 의인화, 공감, 마음 지각, 소비 후 반응, 후회

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